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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,846	01/21/2004	Eileen Saidi	VT-2532	5873
33204	7590	11/28/2006	EXAMINER	
VALENCE TECHNOLOGY, INC. 1889 E. MAULE AVENUE, SUITE A LAS VEGAS, NV 89119			DOVE, TRACY MAE	
			ART UNIT	PAPER NUMBER
			1745	
DATE MAILED: 11/28/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/762,846

Applicant(s)

SAIDI ET AL.

Examiner

Tracy Dove

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-61 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 5/26/04.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☒ Other: IDS 10/25/04.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statements (IDS) submitted on 5/26/04 and 10/25/04 have been considered by the examiner.

Claim Analysis

Claim 1 recites “for used in a lithium cell or battery containing a lithium metal phosphate cathode”, which is not given patentable weight because it is an intended use limitation. The components of the battery do not limit the claimed electrolyte.

Claim 57 recites “for use in a lithium battery or cell which contains a lithium metal phosphate cathode”, which is not given patentable weight because it is an intended use limitation. The components of the battery do not limit the claimed electrolyte.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4 and 5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims encompass a solvent excluding propylene carbonate (claim 4) or diethyl carbonate (claim 5), which is inconsistent with claim 1 that positively recites both propylene carbonate and diethyl carbonate are present in the electrolyte. The claims should be amended to clearly claim the invention.

Claim 61 provides for the use of methyl ethyl carbonate, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is

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intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 61 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8 and 57-61 are rejected under 35 U.S.C. 102(b) as being anticipated by Takami et al., US 5,753,387.

Takami teaches a lithium secondary battery comprising an electrolyte including an electrolytic salt and a nonaqueous solvent. A preferable example of a mixed solvent composition is ethylene carbonate (EC), methyl ethyl carbonate (MEC), propylene carbonate (PC) and diethyl carbonate (DEC). The MEC is contained in an amount of 30-80% to improve the conductivity of the electrolyte (10:7-16). The amount of ethylene carbonate is preferably 20-75% (10:1-2). The salt may be a lithium salt (10:37-44). Regarding claims 4 and 5, Takami teaches the mixed solvent composition may be EC and MEC wherein the amount of PC is 0% and the amount of DEC is 0%. Thus the claims are anticipated.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takami et al., US 5,753,387 in view of Hwang et al., US 6,613,480.

Takami teaches a lithium secondary battery comprising an electrolyte including an electrolytic salt and a nonaqueous solvent. A preferable example of a mixed solvent composition is ethylene carbonate (EC), methyl ethyl carbonate (MEC), propylene carbonate (PC) and diethyl carbonate (DEC). The MEC is contained in an amount of 30-80% to improve the conductivity of the electrolyte (10:7-16). The amount of ethylene carbonate is preferably 20-75% (10:1-2). The salt may be a lithium salt (10:37-44). Regarding claims 4 and 5, Takami teaches the mixed solvent composition may be EC and MEC wherein the amount of PC is 0% and the amount of DEC is 0%.

Takami does not explicitly state the amount of propylene carbonate (PC) or diethyl carbonate (DEC) in the mixed solvent of EC:MEC:PC:DEC disclosed by Takami.

However, Hwang teaches an electrolyte for lithium batteries that includes a cyclic carbonate and at least two linear carbonates. The electrolyte includes 20-60% of cyclic carbonate (2:54-65) and 30-77.5% of linear carbonate (3:1-24). Hwang teaches ethylene carbonate is a preferred cyclic carbonate and both diethyl carbonate and ethyl methyl carbonate

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are preferred linear carbonates. Hwang discloses the cyclic carbonate may be any cyclic carbonate known in the related arts (2:54-65). Propylene carbonate is a cyclic carbonate.

Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because Hwang teaches using cyclic carbonates in a mixed electrolyte solvent in known. If the amount of cyclic carbonate is less than 20% an amount of lithium salts dissolved in the electrolyte is diminished. If the amount of cyclic carbonate is more than 60% the low-temperature characteristics of the battery deteriorate because cyclic carbonate has a high freezing point (2:54-65). Hwang teaches using linear carbonates in a mixed electrolyte solvent is known. If the amount of linear carbonate is less than 30% the effect of decreasing the viscosity and freezing point of cyclic carbonate is not induced. If the amount of linear carbonate is more than 77.5% the effect of decreasing the viscosity and freezing point of cyclic carbonate is induced too much and an adverse effect may be obtained (3:1-8). Thus, one of skill would have been motivated to vary the amounts of the cyclic carbonates and linear carbonates of Takami in order to balance the viscosity and freezing point properties of the mixed solvent, as discussed by Hwang. Furthermore, the courts have ruled where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Swain et al., 33 CCPA 1250, 156 F.2d 239, 70 USPQ 412. The courts have held that a limitation merely with respect to proportions in a composition of matter or process will not support patentability unless such limitation is "critical". Minerals Separation, Ltd. v. Hyde, 242 U.S. 261 (1916). Furthermore, the courts have ruled that discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

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Claims 1-8, 15-20, 22-24, 31-33, 35-37, 44-46, 48-50 and 57-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barker et al., US 6,723,470 ("Barker470") in view of Barker et al., US 5,643,695 ("Barker 695"), and further in view of Kuboki et al., US 6,413,679.

Barker470 teaches a lithium battery comprising a positive electrode, a counter negative electrode, a separator and an electrolyte. The positive electrode comprises a lithium mixed metal phosphate compound having the formula $\text{LiFe}_{1-y}\text{Mg}_y\text{PO}_4$ (10:25-29). The compound $\text{LiFe}_{0.9}\text{Mg}_{0.1}\text{PO}_4$ is specifically disclosed (11:39). The compound $\text{Li}_3\text{V}_2(\text{PO}_4)_3$ is specifically disclosed (11:39-40). The electrolyte comprises any number of suitable solvents and lithium salts. Solvents are selected from diethyl carbonate (DEC), ethylmethyl carbonate (EMC), ethylene carbonate (EC) and propylene carbonate (PC). The salt may be LiPF_6 . Desirable solvents and salts are described in US Patent 5,643,695 (Barker695) (13:3-18). Barker695 teaches a solvent mixture comprising EC and PC with one or more additional solvents included in the solvent mixture. The additional solvents may be MEC, DEC or a mixture of MEC and DEC (3:35-64). Neither Barker470 nor Barker 695 explicitly teaches an example wherein the solvent comprises EC, PC, MEC and DEC.

However, Kuboki teaches a lithium battery comprising an electrolyte including a lithium salt and a solvent mixture. The mixed solvent may be EC, MEC, PC and DEC wherein MEC is preferably 30-80% of the mixture. The EC or PC is preferably 20-75% of the mixture (5:25-67).

Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one of skill would have been motivated to use the EC, MEC, PC and DEC mixed solvent of Kuboki for the electrolyte solvent of Barker470

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in view of the teachings by Barker470 and Barker695 that the solvents may be selected from DEC, EMC, EC and PC (note EMC and MEC are equivalent).

*

Claims 9-14, 21, 25-30, 34, 38-43, 47 and 51-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barker et al., US 6,723,470 ("Barker470") in view of Barker et al., US 5,643,695 ("Barker 695"), further in view of Kuboki et al., US 6,413,679 and further in view of Hwang et al., US 6,613,480.

Barker470 teaches a lithium battery comprising a positive electrode, a counter negative electrode, a separator and an electrolyte. The positive electrode comprises a lithium mixed metal phosphate compound having the formula $\text{LiFe}_{1-y}\text{Mg}_y\text{PO}_4$ (10:25-29). The compound $\text{LiFe}_{0.9}\text{Mg}_{0.1}\text{PO}_4$ is specifically disclosed (11:39). The compound $\text{Li}_3\text{V}_2(\text{PO}_4)_3$ is specifically disclosed (11:39-40). The electrolyte comprises any number of suitable solvents and lithium salts. Solvents are selected from diethyl carbonate (DEC), ethylmethyl carbonate (EMC), ethylene carbonate (EC) and propylene carbonate (PC). The salt may be LiPF_6 . Desirable solvents and salts are described in US Patent 5,643,695 (Barker695) (13:3-18). Barker695 teaches a solvent mixture comprising EC and PC with one or more additional solvents included in the solvent mixture. The additional solvents may be MEC, DEC or a mixture of MEC and DEC (3:35-64). Neither Barker470 nor Barker 695 explicitly teaches an example wherein the solvent comprises EC, PC, MEC and DEC.

However, Kuboki teaches a lithium battery comprising an electrolyte including a lithium salt and a solvent mixture. The mixed solvent may be EC, MEC, PC and DEC wherein MEC is preferably 30-80% of the mixture. The EC or PC is preferably 20-75% of the mixture (5:25-67).

Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one of skill would have been motivated to use the EC, MEC, PC and DEC mixed solvent of Kuboki for the electrolyte solvent of Barker470 in view of the teachings by Barker470 and Barker695 that the solvents may be selected from DEC, EMC, EC and PC (note EMC and MEC are equivalent).

Kuboki does not explicitly state the amount of propylene carbonate (PC) or diethyl carbonate (DEC) in the mixed solvent of EC:MEC:PC:DEC disclosed by Kuboki.

However, Hwang teaches an electrolyte for lithium batteries that includes a cyclic carbonate and at least two linear carbonates. The electrolyte includes 20-60% of cyclic carbonate (2:54-65) and 30-77.5% of linear carbonate (3:1-24). Hwang teaches ethylene carbonate is a preferred cyclic carbonate and both diethyl carbonate and ethyl methyl carbonate are preferred linear carbonates. Hwang discloses the cyclic carbonate may be any cyclic carbonate known in the related arts (2:54-65). Propylene carbonate is a cyclic carbonate.

Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because Hwang teaches using cyclic carbonates in a mixed electrolyte solvent in known. If the amount of cyclic carbonate is less than 20% an amount of lithium salts dissolved in the electrolyte is diminished. If the amount of cyclic carbonate is more than 60% the low-temperature characteristics of the battery deteriorate because cyclic carbonate has a high freezing point (2:54-65). Hwang teaches using linear carbonates in a mixed electrolyte solvent is known. If the amount of linear carbonate is less than 30% the effect of decreasing the viscosity and freezing point of cyclic carbonate is not induced. If the amount of linear carbonate is more than 77.5% the effect of decreasing the viscosity and freezing point

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of cyclic carbonate is induced too much and an adverse effect may be obtained (3:1-8). Thus, one of skill would have been motivated to vary the amounts of the cyclic carbonates and linear carbonates of Kuboki in order to balance the viscosity and freezing point properties of the mixed solvent, as discussed by Hwang. Furthermore, the courts have ruled where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Swain et al., 33 CCPA 1250, 156 F.2d 239, 70 USPQ 412. The courts have held that a limitation merely with respect to proportions in a composition of matter or process will not support patentability unless such limitation is "critical". Minerals Separation, Ltd. v. Hyde, 242 U.S. 261 (1916). Furthermore, the courts have ruled that discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

November 26, 2006



TRACY DOVE
PRIMARY EXAMINER